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fibers, and a [conventional] first screen spaced above said tip plate and having a plurality of holes therein, the [conventional] first screen being attached to said sidewall, the improvement comprising using a second screen lying on top of the first screen, said second screen having a hole diameter and/or hole density in [the] a central portion of the screen that is significantly less than the respective hole diameter and/or hole density in [the] two end portions of the screen such that resistance to flow of molten glass through the central portion of the second screen is greater than the resistance to flow through the two end portions of the second screen [lying on top of the conventional bushing screen].

#### REMARKS

Claims 1-24 remain in the application. Claims 1, 3, and 5-7 were allowed. Claims 2, 4, 8, 11, 16, 17, 20, 21 and 23 were rejected and have been amended above to more particularly point out the invention. The basis in the specification for these amendments are as follows:

"from channel positions", page 3, line 24,

"two end portions", Figure 6,

"one of said end portions being smaller in area than the other of said end portions with the smaller end portion being closest to the channel", Figure 6 and bottom of page 12 and the top of page 13,

"wherein the screen has a thickness of between about 0.009 and 0.015 (or about 0.011) inch", page 14, first full paragraph, and

for the changes to claim 20 - see page 17, first full paragraph through the middle of page 18.

Claims 2, 4, 8-15, and 21-22 were rejected under 35 USC 102 (b) as being clearly anticipated by Stalego. Stalego does not

anticipate the amended claims above because Stalego neither teaches or suggests a bushing having a screen comprising a center or mid portion and two end portions with the end portion closest to the channel being smaller than the other end portion. This is critical to achieving the best performance when the bushing is used in channel positions as pointed out in Figure 6 and the specification at the bottom portion of page 12 and the top portion of page 13. Nothing in Stalego teaches or suggests using a bushing having a different screen design in channel positions than is normally used in the remainder of the positions to improve fiberizing efficiency.

Stalego teaches a bushing having a screen having larger holes in the area of the screen where the bushing tends to be cooler and smaller holes in the area of the screen where the glass is hotter to improve the temperature profile or uniformity of the glass when it reaches the nozzles. Stalego also teaches changing the thickness of the screen, which he teaches can vary between 0.018 and 0.050 inch, see col. 7, lines 60-69. All of these thicknesses are significantly greater than the screen thickness specified in current claims 11-15, an important difference when the precious metal alloys used to make the bushings costs more than \$4500/pound.

The Examiner urged that claims 12-15 do not indicate what the "10%" is a percent of and Applicant respectfully disagrees. These claims are dependent upon claim 11 and claim 11 states that the central or mid portion has a hole area per unit area of the central portion that is significantly less than the hole area of the end portions per unit area of the end portions. Claims 12 further define numerical limits of the term "significantly less" and thus the "at least 10 %" refers to how much the hole area per unit area of the central portion differs from the hole area per unit area of the end portions. Thus if the percent hole area of the end portions is 10 percent, than the screen of claim 12 would have a percent hole area in the central portion of no greater than 9 percent or no greater than 90 percent of the percent open area in the end portions.

For these reasons applicant believes that claims 2, 4, 8-15 and 21-22 are clearly patentably distinguishable over Stalego and respectfully requests that the rejection under 35 USC 102(b) be withdrawn and these claims be allowed.

Claims 16-18 and 20 were rejected under 35 USC 102(b) as being anticipated by Marra. This rejection is traversed because Marra does not teach using a second screen having a significantly lower percentage of hole area than the percentage of hole area of the first screen. Claims are to be read and interpreted in the light of the specification and therefore the Examiner's interpretation of the term "percentage of hole area" is contrary to the teaching of the present specification, see page 5, first full paragraph. Marra teaches using a first screen welded to the sidewalls of a bushing, which screen contains a plurality of ports (holes) 46, and a second movable screen lying on top of the first screen, this second screen having apertures (holes) 51 that can align with the ports 51, see col. 3, lines 49-50. To be aligned the ports in the second screen would have to be the same size and spaced the same as the ports in the first screen and thus the hole (port) area in the second screen per unit area of screen could not be less than the hole area per unit area of screen in the first screen.

The Examiner's assertion that all bushings are designed to make more than one fiber diameter is no longer valid because all bushings are not capable of making 16 micron, 13 micron and 10 micron diameter fiber at maximum productivity. To operate at maximum productivity the temperature of the glass must be within a narrow, optimum fiberizing, range. When trying to use a bushing designed to make 16 micron fiber at maximum productivity to make 13 micron fiber, the flow rate of the molten glass out of the tips requires a pulling speed too high to be practical for state of the art choppers. For example, using a bushing operating at maximum productivity and requiring a pulling speed of 6000 feet/minute to make 16 micron will require a pulling speed of almost 9100

feet/minute to make 13 micron fiber and a pulling speed over 15,300 feet/minute to make 10 micron fiber and both of these higher speeds exceed the efficient operating speed of existing state of the art direct chop choppers. The only way to change this situation without reducing the temperature of the glass, which would greatly reduce the operating efficiency because of the greater break rate that change would cause, is to reduce the flow rate of the molten glass from the tips without changing the glass temperature. Applicant's invention provides this in a novel and unobvious manner.

Regarding the Examiner's argument against claim 17, it is not reasonable to call element 48 in Marra an aperature in the screen 45 because when the bushing is in operation this element is not open for passage of molten glass, but rather it is an opening filled with shaft 62. Therefore, openings 48 would not reasonably be considered by a skilled artisan to be part of the "open area of a bushing screen for the passage of molten glass".

Furthermore, amended claims 16-18 and 20 further patentably distinguish over the teachings and suggestions in Marra since Marra neither teaches or reasonably suggests to one skilled in the art that at least some of the holes in the second screen should be smaller in diameter than the diameter of the holes in the first screen. Therefore, the Examiner is respectfully requested to withdraw this rejection and to allow claims 16-18 and 20.

Claims 18-19 and 23-24 were rejected under 35 USC 103 as being unpatentable over Marra because of the teaching in claim 4 that the ports of the top plate or screen are associated with less than all of the apertures of the bottom plate. According to the teachings of Marra, any ports not in association with an aperture or any aperture not in association with a port would not function as a port or aperture in the sense of permitting molten glass to flow therethrough and thus any such embodiment would not serve to provide greater resistance to flow of the molten glass in the top screen compared to resistance to flow of the bottom screen. Applicant's

attorney cannot find any teaching in the specification explaining an embodiment of claim 4 or the purpose of such an arrangement, e.g. it is not explained in col. 4, lines 22-26, why one would put apertures into the bottom plate that did not associate with a port in the top plate and the reason for such is not apparent to the skilled artisan. There is no suggestion in Marra for making the resistance to flow different in the central portion of the screen than in the two end portions of the screen.

Finally, nothing in Marra suggests putting three additional apertures on each side of the lower screen of Marra and doing so would defeat the purpose of the invention of Marra if the top plate 50 did not cover the apertures, i. e. this would allow too much molten glass to flow and thus the bushing would not be a "dripless", bushing see Marra 4,612,027 for support of this. The large holes in the center portion of the '027 bushing, not throttled by the second plate of the '693 bushing produce a non-dripless situation which would defeat the purpose of Marra '693, thus not an obvious modification. Furthermore, as mentioned above, if the additional apertures which the Examiner says are obvious were to be covered by the top plate 50 but not in association with ports, the skilled artisan would have no reason to put them there. Only hindsight reconstruction after having the benefit of Applicant's disclosure would possibly cause one to imagine such an embodiment from the teachings of Marra.

Claim 23 has been further amended to make it clear that the second screen is used on lying on top of the conventional first screen and that it is the hole size to hole size and hole density to hole density relationship in the two screens that is being described and compared.

For these reasons claims 18-19 and 23-24 are believed to be patentable over the reasonable teachings of Marra and the Examiner is respectfully requested to withdraw this rejection and to allow these claims.

Claim 24 was rejected under 35 USC 103 as being unpatentable over Marra for the reasons used against claim 23 and further in view of the teachings of Stalego. This rejection is traversed because the claim required the second screen to be lying on top of the conventional bushing screen, not spaced far away from the conventional bushing screen. Amended claim 23 has been amended to more clearly point this out. For this reason and the reasons given above with respect to claim 23 applicant believes this claim is patentable and respectfully requests the Examiner to withdraw this rejection and to allow this claim.

The other references cited, but not used in the rejections of the claims, have been reviewed, but do not, alone or in any reasonable combination, anticipate the presently claimed invention or make this invention obvious to the skilled artisan, in the sense of 35 USC 103.

The Examiner has requested that Figures 1-4 be labeled "Prior Art". That has been done and proposed drawings with this change accompany this action along with a letter to the draftsman.

Claims 20-24 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to point out and distinctly claim the invention because of the terms "designed to make" in claim 20 and "the screen lying on top -- screen", "the screen" (line 8), and "conventional" in claim 23. Claims 20 and 23 have been amended to provide clear antecedent basis and to remove the term "conventional". The first screen, being in the preamble, makes it clear that it is a conventional bushing screen. Applicant believes that claims 20-24 meet the requirements of 35 USC 112, second paragraph and accordingly respectfully requests the Examiner to withdraw this rejection and to allow these claims.

All of the claims are now believed to be in condition for allowance, but if the Examiner feels further amendment is necessary

the Examiner is invited to call applicant's attorney at 303-978-3927  
for the purpose of expediting the disposal of this application.

Respectfully submitted,

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